

CLAIMS

What is claimed is:

1. A deposition chamber comprising:
a chamber body having a cavity formed therein;
a chamber lid configured to enclose the cavity;
a gas delivery head positioned within the cavity;
a feedthrough device positioned in the chamber body, the feedthrough device being configured to receive vapor from a vapor source and transfer the vapor therethrough along a pathway toward the gas delivery head; and
a heating device associated with the feedthrough device.
2. The deposition chamber of claim 1, wherein the feedthrough device includes a lumen defined therethrough for transferring the amount of vapor.
3. The deposition chamber of claim 2, wherein the feedthrough device includes a longitudinal body portion having a continual helical groove formed on a surface thereof.
4. The deposition chamber of claim 3, wherein the heating device includes a resistance heater and wherein at least a portion of the resistance heater is positioned within the helical groove of the feedthrough device.
5. The deposition chamber of claim 4, wherein the helical groove is configured to complementarily receive the at least a portion of the resistance heater.
6. The deposition chamber of claim 4, wherein the resistance heater includes a pair of electrical resistance leads having at least a portion thereof disposed within a conductive sheathing.
7. The deposition chamber of claim 6, wherein the conductive sheathing is formed of

stainless steel.

8. The deposition chamber of claim 6, wherein the heating device further includes a temperature sensing device.

9. The deposition chamber of claim 8, wherein the temperature sending device includes a thermocouple.

10. The deposition chamber of claim 9, wherein the thermocouple is positioned within the conductive sheathing.

11. The deposition chamber of claim 6, wherein at least a portion of the conductive sheathing is cold formed into a helical pattern complementary with the helical groove.

12. The deposition chamber of claim 6, wherein at least a portion of the conductive sheathing is adhered to the feedthrough device.

13. The deposition chamber of claim 6, wherein at least a portion of the conductive sheathing is welded to the feedthrough device.

14. A feedthrough device for conveying liquid through a chamber body of a deposition chamber, the feedthrough device comprising:
a longitudinal body having a first end and a second end;
a lumen defined to extend through the longitudinal body from the first end to the second end; and
a heating device associated with the longitudinal body configured for heating the feedthrough device, wherein the feedthrough device is configured to be complementarily received in an internal portion of the chamber body.

15. The feedthrough device of claim 14, wherein the heating device includes a

resistance heater.

16. The feedthrough device of claim 15, further comprising a helical groove formed on an exterior surface of the longitudinal body and wherein at least a portion of the resistance heater is disposed within the helical groove.

17. The feedthrough device of claim 16, wherein the resistance heater includes a conductive sheath and wherein the helical groove is configured to complementarily receive at least a portion of the conductive sheath.

18. The feedthrough device of claim 17, wherein at least a portion of the conductive sheathing is adhered to the longitudinal body.

19. The feedthrough device of claim 17, wherein at least a portion of the conductive sheathing is welded to the longitudinal body.

20. The feedthrough device of claim 17, wherein the conductive sheath is formed of stainless steel.

21. The feedthrough device of claim 14, further comprising a temperature sensing device associated with the heating device and longitudinal body.

22. The feedthrough device of claim 21, wherein the temperature sensing device includes a thermocouple.

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A5 > 23. The feedthrough device of claim 21, wherein the temperature sensing device is positioned within the conductive sheath.

24. The feedthrough device of claim 14, further comprising a shoulder portion

adjacent the first end of the longitudinal body portion, wherein the longitudinal body portion exhibits a first diameter and the shoulder portion exhibits a second larger diameter.

25. The feedthrough device of claim 24, further comprising at least one channel formed in a surface of the shoulder portion, the at least one channel being configured to at least partially receive a sealing member therein.

26. The feedthrough device of claim 24, further including a coupling portion adjacent the second end of the longitudinal body, the coupling portion being configured to be sealingly coupled to a portion of plumbing associated with a vapor source.

27. The feedthrough device of claim 26, wherein the coupling portion includes a set of threads.

SUB 6 > 28. The feedthrough device of claim 26, wherein at least the longitudinal body portion comprises stainless steel.

29. The feedthrough device of claim 26, wherein at least the longitudinal body portion comprises aluminum.

30. A method of converting a chemical vapor deposition chamber having a chamber body, a chamber lid and a first feedthrough device positioned in an interior portion of the chamber body into an atomic layer deposition chamber, the method comprising: removing the first feedthrough device from the chamber body; and inserting a second feedthrough device and an associated heating device into the interior portion of the chamber body.

SUB 7 > 31. The method according to claim 29, further comprising configuring the associated heating device to helically surround at least a portion of the second feedthrough device.

32. The method of according to claim 31, further comprising forming a helical groove in the second feedthrough device to complementarily receive at least a portion of the associated heating device.

500 A₈ > 33. A method of converting a chemical vapor deposition chamber having a chamber body, chamber lid and a feedthrough device positioned in an interior portion of the chamber body into an atomic layer deposition chamber, the method comprising:
removing the feedthrough device;
fitting the feedthrough device with a heater device;
disposing the feedthrough device and heater device into the interior portion of the chamber body.

34. The method according to claim 33, wherein fitting the feedthrough device with a heater device includes forming a helical groove in an exterior surface of the feedthrough device and complementarily positioning at least a portion of the heater device into the helical groove.

500 A₉ > 35. A method of delivering vapor to a gas delivery head in a deposition chamber, the method comprising:
providing a source of vapor;
defining a gas delivery path between the source of vapor and the gas delivery head including:
providing a first section of plumbing from the source of vapor to a chamber body of the deposition chamber;
providing a feedthrough device in an interior portion of the chamber body;
coupling the feedthrough device to the first section of plumbing;
providing a second section of plumbing from the feedthrough device to the gas delivery head; and
coupling the second section of plumbing to the feedthrough device;
heating the first section of plumbing; and
heating the feedthrough device.

36. The method according to claim 35, wherein heating the feedthrough device includes providing a resistance heater and helically positioning a portion of the resistance heater about a length of the feedthrough device.

37. The method according to claim 36, further comprising forming a helical groove along an exterior surface of the feedthrough device and positioning at least a portion of the resistance heater in the helical groove.

11/11/2019 10:00:00 AM